UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,190	02/04/2002	Dan-Keun Sung	P21950	8702

7055 7590 12/02/2005

GREENBLUM & BERNSTEIN, P.L.C.
1950 ROLAND CLARKE PLACE
RESTON, VA 20191

EXAMINER	
TON, DANG T	

ART UNIT	PAPER NUMBER
2666	

DATE MAILED: 12/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/030,190	SUNG ET AL.	
	Examiner	Art Unit	
	DANG T. TON	2666	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/6/2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

1b. The abstract of the disclosure is objected to because the term " Fig.10a" should be deleted from the abstract. Correction is required. See MPEP § 608.01(b).

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

3. Claims 5-7 and11-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

For claim 5 line 3 , claim 6 line 3, and claim 7 line 3, " the orthogonal code" lacks antecedent basis since it is not known which " the orthogonal code" applicant is referring to. The same is true with the term " the second communication station" recited in claim 11.

Claim 12 is rejected since it depends from claim 11.

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., In re Berg, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); In re Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); In re Longi, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); In re Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); In re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an

invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-44 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-61 of copending Application No. 10/089,051. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following formalities:

For claims 1-44, the claims 1-61 of copending Application No. 10/089,051 disclose a system/ method comprising : multi-dimensional orthogonal resource hopping multiplexing communication comprising a digital communication system that includes a primary communication station and secondary communication stations and a multi-dimensional orthogonal resource hopping multiplexing system for statistical multiplexing of the synchronous communication channels from the primary communication station to the secondary communication stations.

wherein the multi-dimensional orthogonal resource hopping multiplexing system comprises; a multi-dimensional hopping pattern generator which is located in the transmitter of the primary communication station, a data symbol modulator that selects the corresponding orthogonal resource patterns in terms of the output from the multi-dimensional hopping pattern generator a collision detector and controller that detects whether a collision occurs or not between the multi-dimensional hopping patterns and compares the consistency of the data symbols toward the secondary communication stations between the collision interval, a transmission power controller that controls the transmission power of the remaining parts except the part where the multi-dimensional hopping patterns collide and the transmission stops due to transmitting data symbol inconsistency, and compensates for the loss in the average reception energy due to a transmission stoppage.

wherein the channels can be distinguished through hopping multi-dimensional orthogonal resource coordinates due to a synchronization from the primary communication station to a plurality of secondary communication stations.

wherein the multi-dimensional orthogonal resource coordinates of dimension N can be represented as (orthogonal resource#1, orthogonal resource#2, . . . , orthogonal resource#N)

wherein the orthogonal resource#1 is frequency, the orthogonal resource#2 is transmission time or position of data symbol and orthogonal resource#3 is orthogonal code.

wherein the multi-dimensional orthogonal resource hopping is statistical multiplexing using a one-dimensional orthogonal resource hopping multiplexing method which only one coordinate of the orthogonal axes hops.

wherein the one-dimensional orthogonal resource is frequency.

wherein the one-dimensional orthogonal resource is transmission time or position of data symbol.

wherein the one-dimensional orthogonal resource is orthogonal code.

wherein the multi-dimensional orthogonal resource hopping is statistical multiplexing using a two-dimensional orthogonal

resource hopping multiplexing method in which two coordinates of the orthogonal axes hop.

wherein the two-dimensional orthogonal resource consists of (frequency, transmission time or position).

wherein the two-dimensional orthogonal resource consists of (frequency, orthogonal code).

wherein the two-dimensional orthogonal resource consists of (transmission time or position, orthogonal code).

wherein the multi-dimensional orthogonal resource hopping is statistical multiplexing using a three-dimensional orthogonal resource hopping multiplexing method in which three coordinates of the orthogonal axes undergo hopping.

wherein the three-dimensional orthogonal resource consists of (frequency, transmission time or position, orthogonal code).

wherein the multi-dimensional orthogonal resource hopping of dimension N is statistical multiplexing using a multi-

dimensional dimensional orthogonal resource hopping multiplexing method in which multi-dimensional (orthogonal resource# 1, orthogonal resource#2, ... , orthogonal resource#N) coordinates of the orthogonal axes undergoes hopping.

wherein the orthogonal code is Hadamard Code.

wherein the orthogonal code is Orthogonal Variable Spreading Factor Code.

wherein the orthogonal code is orthogonal Gold Code.

wherein the multi-dimensional orthogonal resource hopping patterns between the secondary communication stations, which are allocated by the primary communication station to the secondary communication stations at the beginning of a communication and are released at the end of the communication, are dependent.

wherein the multi-dimensional orthogonal resource hopping pattern is allocated to each secondary communication station uniquely and therefore, become independent between the secondary communication stations.

wherein the multi-dimensional orthogonal resource hopping multiplexing is carried out for statistically coarse or burst channels in order to attain statistical multiplexing gain.

wherein the burst channels are communication channels toward the secondary communication stations whose transmission rate varies below the allocated basic transmission rate at the time of a call establishment.

wherein the burst channels are communication channels toward the secondary communication stations whose transmission rate varies below the allocated average transmission rate at the time of a call establishment.

wherein the physical channel control command toward a secondary communication station is transmitted by using a separate physical channel.

wherein the physical channel includes the transmission power control command for the secondary communication station.

wherein the physical channel includes the transmission rate of the primary communication station.

wherein the physical channel contains the physical channel control command for the secondary communication station after time division multiplexed.

wherein the physical channel does not collide with other orthogonal transmission channels from the primary communication station.

wherein multi-dimensional hopping patterns which do not collide, are used in order not to collide the physical channel with other orthogonal transmission channels from the primary communication station.

wherein fixed orthogonal resource allocation like the conventional orthogonal resource division multiplexing method is included so that the physical channel does not collide with other orthogonal transmission channels from the primary communication station.

wherein the multi-dimensional orthogonal resource hopping patterns for a statistical multiplexing are pseudo-randomly generated.

wherein the pseudo-randomly generated multi-dimensional orthogonal resource hopping patterns are generated by Pseudo Noise (PN) sequence generators.

wherein a plurality of the multi-dimensional orthogonal resource hopping patterns for statistical multiplexing can be allocated to one of the secondary communication stations according to the transmission data rate of the primary communication station.

wherein a plurality of hopping patterns toward one of the secondary communication stations undergo dependent hopping in a communication by the multi-dimensional orthogonal resource hopping patterns in order to avoid collisions.

wherein the communication by the multi-dimensional orthogonal resource hopping patterns allows collisions by undergoing independent hopping

wherein the communication by the multi-dimensional orthogonal resource hopping patterns periodically repeat on the basis of a frame unit.

wherein the frame is an independent data unit based on the channel coding.

wherein the collisions of multi-dimensional orthogonal resource hopping patterns occurring from independent multi-dimensional orthogonal resource hopping patterns of the channels toward the secondary communication stations can cause not to transmit the data symbols of all corresponding channels during the symbol duration by previously detecting collisions at the primary communication station.

wherein the data symbols are transmitted when a comparison at the time of a collision of the multi-dimensional orthogonal resource hopping patterns shows that all the transmitting data symbols of corresponding channels are identical.

wherein the data symbols are not transmitted when a comparison at the time of a collision of the multi-dimensional orthogonal resource hopping patterns shows that not all the transmitting data symbols of corresponding channels are identical.

wherein the transmission power is increased for the transmitting data symbols after the transmitting data symbols are not

transmitted because the transmitting data symbols are not identical at the time of a collision of the multi-dimensional orthogonal resource hopping patterns.

wherein the transmission power increase is allowed in such an amount and at an interval given by the system parameters.

wherein the two system parameters depend on the location of the data symbols which are not transmitted.

wherein the two system parameters are equal to or greater than zero.

wherein the hopping pattern collision processing method is only carried out when a serious error occurs during a channel decoding process in the secondary communication stations due to an overlapping of transmission antenna beams of the channels from the primary communication station where the hopping patterns collide.

wherein the multi-dimensional hopping pattern collision processing method is only carried out when a serious error occurs during a channel decoding process in the secondary

communication stations due to an overlapping of transmission antenna beams of the channels in the primary communication station where the multi-dimensional hopping patterns collide.

wherein a pilot signal is used for coherent demodulation through acquisition, tracking and phase estimation.

wherein the multi-dimensional hopping patterns use the hopping patterns which do not collide in order to protect from a loss of phase distortion compensation capability due to collisions.

wherein the pilot signal exists in all sub-carriers that are involved in frequency hopping multiplexing.

wherein the hopping patterns which do not collide include an allocation of fixed orthogonal resource like the multi-dimensional orthogonal resource division multiplexing method.

multi-dimensional orthogonal resource hopping multiplexing communication comprising; a multi-dimensional orthogonal resource hopping pattern generator a multi-dimensional orthogonal resource generator that generates multi-dimensional orthogonal resource according to the multi-dimensional hopping

patterns a multi-dimensional hopping pattern collision detector that detects the collision of the multi-dimensional hopping patterns.

wherein the multi-dimensional orthogonal resource generator consists of a frequency synthesizer.

wherein the multi-dimensional orthogonal resource generator consists of buffers for controlling the position of transmission data symbol.

wherein the multi-dimensional orthogonal resource generator consists of an orthogonal code generator.

wherein the multi-dimensional orthogonal resource generator consists of a combination of a frequency synthesizer, buffers, a spreading orthogonal code generator.

multi-dimensional orthogonal resource hopping multiplexing communication as claimed in claim 52, wherein the multi-dimensional hopping pattern collision detector comprising;
a transmitting data symbol comparator which compares whether the data symbols for the corresponding channels are identical or not

at the time of collision of the multi-dimensional hopping patterns, a puncturer which can stop the transmission of the data symbol when the comparator indicates that all the corresponding data symbols are not identical.
multi-dimensional orthogonal resource hopping multiplexing communication of a spread spectrum communication comprising a digital communication system that includes a transmission apparatus of the primary communication station and a reception apparatus of the secondary communication station, wherein the transmission apparatus of the primary communication station comprising; a channel encoder a multi-dimensional orthogonal resource hopping pattern generator a multi-dimensional orthogonal resource generator that generates multi-dimensional orthogonal resources according to the multi-dimensional hopping pattern.

multi-dimensional orthogonal resource hopping multiplexing communication of a spread spectrum communication comprising a digital communication system for multi-dimensional orthogonal resource hopping multiplexing which operates with two separate orthogonal resource groups comprising; a first orthogonal resource group for a division multiplexing by fixed and exclusive allocation of orthogonal resources a second orthogonal

resource group for a statistical multiplexing through orthogonal resource hopping.

wherein a multi-dimensional orthogonal resource division multiplexing is carried out for a less burst channels by fixedly and exclusively allocating the orthogonal resources in the first orthogonal resource group to the transmitting data symbols.

wherein a multi-dimensional orthogonal resource hopping multiplexing is carried out using multi-dimensional orthogonal resource hopping patterns for a burst channels by using the orthogonal resources in the second orthogonal resource group.

NOTE: See claims 1-61 of copending Application No. 10/089,051.

Applicant's claims 1-44, merely broaden the scope of the claims 1-61 of copending Application No. 10/089,051 by eliminating the terms " multi-dimensional" , " primary" and " the synchronous" from claims 1,58, and 59 of claims 1-61 of copending Application No. 10/089,051. It has been held that the omission of an element and its function is an obvious expedient if the remaining elements perform the same function as before. In re karlson, 136 USPQ 184 (CCPA). Also note Ex Parte Raine,

168 USPQ 375 (bd. App. 1969); omission of a reference element whose function is not need would be obvious to one skilled in the art.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (Multicarrier CDMA with Adaptive Frequency Hopping for Mobile Radio Systems) in view of Emilsson et al. (6,498,788).

For claims 1-6, Chen et al. disclose a Multicarrier CDMA with Adaptive Frequency Hopping for Mobile Radio Systems comprising the steps of performing multiplexing for communications channels from a first station to second stations by an orthogonal code hopping multiplexing communication (see figure 1 page 1852 and column 2 lines 20-40).

For Claims 1 and 6, Chen et al. disclose all the subject matter of the claimed invention with the exception of using a statistical multiplexing in a communications network. Emilsson et al. from the same or similar fields of endeavor teaches a provision of statistical multiplexing(see column 8 lines 22-25). Thus, it would have been obvious to the person of ordinary skill in the art at the time of the invention to use statistical

multiplexing as taught by Emilsson et al. in the communications network of Chen et al.

The statistical multiplexing can be implemented/modified into the network of Chen et al. by replacing the multiplexing device of Chen et al. with statistical multiplexing device . The motivation for using statistical multiplexing into the communications network of Chen et al. being that it saves bandwidth when the station does not data to transmits .

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. in view of Emilsson et al. as applied to claim 1 above, and further in view of the background of Park (6,657985).

For Claims 5 and 7, Chen et al. and Emilsson et al. disclose all the subject matter of the claimed invention with

the exception of using Gold code and Hadamard code in a communications network. The background of Park from the same or similar fields of endeavor teaches a provision of Gold code and Hadamard code (see column column 1 lines 13-15). Thus, it would have been obvious to the person of ordinary skill in the art at the time of the invention to use the Gold code and Hadamard code as taught by Park in the communications network of Chen et al and Emilsson et al.

The Gold code and Hadamard code can be implemented/modified into the network of Chen et al. since it does teach CDMA. The motivation for using the Gold code and Hadamard code into the communications network of Chen et al. being that it provides the codes to the users .

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANG T. TON whose telephone number is 571-272-3171. The examiner can normally be reached on MON-WED, 5:30 AM-6:00 PM and Thur 5:30-9:30 A.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, RAO SEEMA can be reached on 571-272-3174. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

D. Ton

DANG TON
PRIMARY EXAMINER